

## CLAIMS

1 1. A circuit for controlling an array of  $n$  electrostatic actuators,  
2 where  $n$  is an integer, comprising:

3 at least one high voltage generator for providing a desired  
4 voltage;

5  $n$  switches operably connected to said generator, each switch  
6 being directly connected to one of said  $n$  electrostatic actuators;

7  $n$  capacitors, one of which is connected in parallel to each of  
8 said  $n$  actuators for receiving voltage from said high voltage generator  
9 through said switch; and

10 a central processor for controlling said desired voltage, said  
11 processor further controlling the time each of said  $n$  switches is  
12 closed to apply said voltage to said capacitors and electrostatic  
13 actuators to establish and/or restore said desired voltage therein.

1 2. The circuit of claim 1, wherein the output of said high voltage  
2 generator is a constant high voltage.

1 3. The circuit of claim 1, wherein the output of said high voltage  
2 generator is a constant slope, ramp high voltage.

1 4. The circuit of claim 1, wherein the output of said high voltage  
2 generator is a multiple successive slope, ramp high voltage.

1 5. The circuit of claim 4, wherein said multiple successive, ramp  
2 high voltage contains different slopes to minimize the time of  
3 actuation of said  $n$  switches.

1 6. The circuit of claim 1, wherein the output of said high voltage  
2 generator is a staircase high voltage.

1 7. The circuit of claim 1, wherein the output of said high voltage  
2 generator has an output switch for minimizing the power.

1 8. The circuit of claim 1, wherein  $n$  is at least 1,000.

1 9. The circuit of claim 1, wherein  $n$  is between 1,000 and 10,000.

1 10. The circuit of claim 1, wherein said central processor is adapted  
2 to calculate the voltage leakage for each of said  $n$  electrostatic  
3 actuators and capacitors to thereby determine the time said switch is  
4 closed.

1 11. A circuit for controlling an array of  $n$  electrostatic actuators,  
2 where  $n$  is an integer, comprising:

3 at least one high voltage generator means for providing a desired  
4 voltage;

5  $n$  switch means for transmitting said desired voltage and  
6 operably connected to said generator, each switch means being  
7 directly connected to one of said  $n$  electrostatic actuators;

8 n capacitor means for storing said voltage, one of which is  
9 connected in parallel to each of said n actuators for receiving voltage  
10 from said high voltage generator means through said switch means;  
11 and

12 central processor means for controlling said desired voltage,  
13 said processor means further controlling the time each of said n  
14 switch means is closed to apply said voltage to said capacitor means  
15 and electrostatic actuators to restore said desired voltage therein.

1 12. The circuit of claim 11, wherein the output of said high voltage  
2 generator means is a constant high voltage.

1 13. The circuit of claim 11, wherein the output of said high voltage  
2 generator means is a constant slope, ramp high voltage.

1 14. The circuit of claim 11, wherein the output of said high voltage  
2 generator means is a multiple successive slope, ramp high voltage.

1 15. The circuit of claim 14, wherein said multiple successive, ramp  
2 high voltage contains different slopes to minimize the time of  
3 actuation of said n switch means.

1 16. The circuit of claim 11, wherein the output of said high voltage  
2 generator means is a staircase high voltage

1 17. The circuit of claim 11, wherein n is at least 1,000.

1 18. The circuit of claim 11, wherein  $n$  is between 1,000 and 10,000.

1 19. The circuit of claim 11, wherein said central processor means is  
2 adapted to calculate the voltage leakage for each of said  $n$  electrostatic  
3 actuators and capacitor means to thereby determine the time said  
4 switch is closed.

1 20. A method for controlling an array of  $n$  electrostatic actuators,  
2 where  $n$  is an integer of, comprising the steps of:

3 providing a desired voltage output from at least one high voltage  
4 generator;

5 connecting  $n$  switches to said voltage output and connecting  
6 each switch to one of said  $n$  electrostatic actuators;

7 connecting  $n$  capacitors in parallel to corresponding  $n$  actuators  
8 for receiving voltage from said high voltage generator through said  
9 switch such that each capacitor and its corresponding actuator is  
10 charged when said switch is closed to apply said voltage output; and

11 controlling said desired voltage with a central processor, said  
12 processor further controlling the time each of said  $n$  switches is  
13 closed to apply said voltage to said capacitors and electrostatic  
14 actuators to restore said desired voltage therein.

1 21. The method of claim 20, wherein the output generated by said  
2 high voltage generator is a constant high voltage.

1 22. The method of claim 20, wherein the output generated by said  
2 high voltage generator is a constant slope, ramp high voltage.

1 23. The method of claim 20, wherein the output generated by said  
2 high voltage generator is a multiple successive slope, ramp high  
3 voltage.

1 24. The method of claim 23, wherein said multiple successive, ramp  
2 high voltage contains different slopes to minimize the time of  
3 actuation of said n switches.

1 25. The method of claim 20, wherein the output generated by said  
2 high voltage generator is a staircase high voltage

1 26. The method of claim 20, wherein n is at least 1,000.

1 27. The method of claim 20, wherein n is between 1,000 and  
2 10,000.

1 27. The method of claim 19, wherein said central processor  
2 calculates the voltage leakage for each of said n electrostatic actuators  
3 and capacitors to thereby determine the time said switch is closed.